The Office of Naval Research University/Laboratory Initiative

July 2006

To attract more academically trained professionals into weapon-related research and thereby increase the "knowledge base" for undersea weapon technology, the Office of Naval Research (ONR) has created the University/Laboratory Initiative (ULI) Program to sponsor graduate-level research performed in collaboration with experienced personnel at Navy laboratories. The program funds a student and academic advisor at a university and, under a separate contract, a "mentor" at a Navy laboratory. Students must be United States citizens and open to employment at a Navy laboratory upon graduation. Students are also expected to spend some portion of each year at the collaborating laboratory. Current funding limits are $70K/year for each university project and $55K/year for each Navy laboratory project.

The Office of Naval Research
University/Laboratory Initiative

Background

In 2000, the Naval Studies Board Committee for Undersea Weapons Science and Technology of the National Research Council issued the report *An Assessment of Undersea Weapons Science and Technology*.[1] The report summarized the Committee's findings after assessing the state of the Navy's undersea weapons program and evaluating the Navy-sponsored and non-Navy-sponsored research related to the development of future undersea weapons.

Aside from identifying the decade-long trend of decreasing defense spending by the United States for undersea weapons research, development and acquisition, the Committee also found that that the pool of technical experts in undersea weapons technology is diminishing:

> *"The knowledge-base pipeline is thin in academia, government, and industry because of the low levels of funding available to support research. Undersea weapon [science and technology] is not viewed as an attractive career path..."*

To attract more academically trained professionals into weapon-related research and thereby increase the "knowledge base" for undersea weapon technology, the Office of Naval Research (ONR) has created the University/Laboratory Initiative (ULI) Program to sponsor graduate-level research performed in collaboration with experienced personnel at Navy laboratories. Here, the term "Navy laboratories" includes not only federal institutions such as the Naval Underwater Warfare Center in Newport, RI, but also university laboratories that have a long-standing history of performing Navy-sponsored research such as the Applied Physics Laboratory of Johns Hopkins University in Laurel, MD. (See Appendix A.) Furthermore, for the purpose of this program, the term "undersea weapons" includes not only conventional torpedoes, but also countermeasures and offensive systems such as submarine-launched mines and armed unmanned underwater vehicles (UUVs).

Program Structure and Activities

The ULI Program is part of the ONR Undersea Weaponry Thrust, a collection of weapon technology programs administered by the ONR Undersea Weapons and Naval Materials Research Division (Code 332). These programs fund basic and applied research in the following Undersea Weaponry Core Technology Areas:

[1] Available from the Naval Studies Board, National Research Council, 2101 Constitution Avenue, N.W., Washington, DC 20418

- Guidance and Control
  - Sensors
  - Signal Processing
  - Planning and Control Algorithms

- Energy Conversion
  - Batteries
  - Fuel Cells
  - Motors

- Hydrodynamics
  - Control Surfaces
  - Propulsors
  - Drag and Noise Reduction

- Warheads
  - Explosives
  - Detonators
  - Fuses

ULI Program goals, requirements, funding limits and meeting schedule are determined by a single ONR program officer who serves as the ULI Program Point of Contact. Projects funded under the program may be directly monitored by any one of the program officers administering programs in undersea weapons technology or a related area.

Each year, typically in early June, a program review is held during which students present either their proposed research projects (if a student is new to the program) or progress made under on-going projects during the past year. The purpose of this activity is to expose students to the review process commonly employed by Department of Defense program managers. The students' academic advisors and collaborators and ONR personnel involved with the ULI Program are encouraged to attend. During the review, the quality of the students' work is reviewed by a Board of Visitors, an *ad hoc* group comprised of distinguished persons with a background in defense science and engineering, experience with undersea weapons technology or related systems, and an understanding of the academic environment. (See Appendix B.)

ULI Program reviews are organized by the Naval Undersea Warfare Center, Division Newport (NUWCDIVNPT), which also assists ONR in program development, maintaining program e-mail lists, tracking students and conducting surveys.

Requirements

Navy laboratories engaged in undersea weapons research and development and universities are encouraged to seek out graduate students interested in pursing graduate or post-doctoral research in one or more of the Undersea Weaponry Core Technology Areas listed above. Preference will be shown towards students pursuing a doctorate.

For each ULI project, three individuals are involved: a student, the student's academic advisor and a "mentor" at a Navy laboratory.

Students must be United States citizens.

Laboratory personnel participating in this program (laboratory mentors) are to interact with the student and play an active role in the development of a student's research proposal and its execution. It is expected that a student will spend some portion of each calendar year working at the collaborating laboratory via a summer internship or similar arrangement. This may require a student to obtain a security clearance.

These requirements are subject to change according to recommendations of the ULI Program Board of Visitors and the judgment of the ONR program officer administering the program.

Funding

Universities participating in the ULI Program may receive up to $70K per project per year through a grant, and collaborating Navy laboratories may receive concomitant funding of up to $55K per project per year. Funds will be provided in annual increments. These increment amounts, as well as per-project limits, are subject to change according to year-to-year changes in funds made available to support the program. The duration of funding will depend upon the nature of the research and the degree pursued by student. Projects related to a student pursing a doctorate are anticipated to be funded for three years, and for a master's degree, two years.

The funds directed to a university are to pay the full-time stipend and tuition of one graduate student, some fraction of the salary of the student's academic advisor, as well as the cost of travel, publication and equipment. University grant recipients must be permanent faculty members, and not visiting professors from other countries, as the intent of the program is to build the US knowledge base for undersea weapons. Faculty members are discouraged from using the funds to support more than one student during the lifetime of a single grant.

The funds directed to the associated Navy laboratory are for part-time support of the student's laboratory mentor, materials to support the project, travel, publication and possibly some or all of the student's salary while working at the laboratory.

It will generally be convenient and expeditious for a student to work at the laboratory as a contractor, thus eliminating the need for the laboratory to hire the student directly (often a lengthy process). Students are therefore encouraged to apply to the ONR Naval Research Enterprise Intern Program (NREIP) to receive a stipend. Currently, NREIP offers graduate students a $6,500 stipend for a ten-week term. Funds for ULI students participating in NREIP will be provided apart from the funds sent to the laboratory and university. Additional information on the NREIP can be found at http://www.onr.navy.mil/sci_tech/3t/corporate/nreip.asp.

How to Submit a Proposal

Prior to submitting any paperwork, the ULI Program Point of Contact (listed below) should be contacted to determine if a proposed research project is appropriate and funding is available. Depending on which Core Technology Area the project falls under, the inquiry may directed to one or more ONR program officers administering programs within the Undersea Weaponry Thrust. A single white paper may be submitted to the ULI Program Point of Contact or assigned program officer by either the university or laboratory before proposals containing extensive technical and cost statements are submitted.

To formally pursue funding, the laboratory and university must submit separate proposals to the assigned ONR program officer. Although the technical content of these proposals can be similar,

each must state the tasks and funding requirements unique to each institution. If accepted, the assigned program officer will directly monitor and evaluate the technical progress of the research projects.

The student must provide a vita and proof of United States citizenship. A copy of a state birth certificate or passport will suffice.

Students must be open to employment at the collaborating laboratory, or any laboratory that performs undersea-weapons research, upon completion of their degrees. A statement to this effect must be provided with each student's vita and proof of citizenship.

Prospective ULI students must be positioned to complete the bulk of their degree requirements under the support of ULI funds. A faculty member or mentor who identifies a student as a "placeholder" in their proposal—a practice sometimes employed with the aim of increasing chances for selection—risk termination of their grant.

Guidance for submitting a proposal to ONR may be found on the ONR web site at http://www.onr.navy.mil/02/how_to.asp. Additional information may be found in the document *Guidance for Preparing White Papers and Proposals* available from the ULI Program Point of Contact listed below.

White papers and proposals are generally submitted with reference to a Broad Agency Announcement (BAA), a written public announcement that ONR is positioned and willing to fund efforts to research and solve technical problems in a given topic. When submitting a white paper or proposal for consideration under the ULI Program, the Undersea Weaponry Science and Technology Program BAA should be referenced. If this BAA has expired, these documents may be submitted under ONR's Long-Range BAA. Current and expired BAAs may be found at the following web page: http://www.onr.navy.mil/02/baa/.

ULI Program Point of Contact

Maria G. Medeiros
Office of Naval Research, Code 333
875 North Randolph Street
Arlington, VA 22203-1995

Phone: 703-696-5034 or 401-832-2454
E-mail: medeirm@onr.navy.mil or MedeirosMG@npt.nuwc.navy.mil

Appendix A: ULI Program Charter

The mission of the University/Laboratory Initiative (ULI) Program is to attract academically trained professionals into weapon-related research so as to increase the "knowledge base" for the United States Navy, helping to restore and revitalize the currently diminishing pool of technical experts in undersea weapons technology, as well as revitalize existing, and establish new, connections between Navy laboratories and academic institutions.

The mission will be accomplished by sponsoring graduate students who will perform their degree research in collaboration with experienced personnel at Navy laboratories or university laboratories that have a long-standing history of performing Navy-sponsored research. Students must seek degrees at either the masters, doctoral or post-doctoral level, and must be United State Citizens to be eligible for employment at defense research and development institutions upon graduation. Each student's thesis research must be in, or related to, at least one of the following Undersea Weaponry Core Technology Areas: Guidance and Control, Energy Conversion, Hydrodynamics, and Warheads.

Appendix B: ULI Board of Visitors Charter

The University/Laboratory Initiative (ULI) Program Board of Visitors is an *ad hoc* group selected each year by the Office of Naval Research (ONR) to review the proposed and on-going research of the ULI students and make recommendations regarding the program's structure, policy and execution. It will do this by attending the annual program review held each year. During each review, the Board is to consider the following questions:

1. Are the number and distribution of students among academic disciplines, as well as their research topics, appropriate to meet ULI Program goals?
2. Are the right institutions participating in the ULI Program?
3. What is the current state of undersea weapons science and technology, and related research and development activities and infrastructures, and will the ULI Program have any impact on them?

Board members should have backgrounds in engineering or applied science, experience in the technology of undersea weapons, or related systems, and an understanding of the academic environment. They should be individuals of vision, dedicated to the advancement of naval technology.